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SELECTING, FEEDING, AND CARING FOR LIGHT HORSES.
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RESOURCE MATERIAL FOR USE IN HIGH SCHOOL VOCATIONAL AGRICULTURE AND ADULT FARMER CLASSES WAS DESIGNED BY SUBJECT MATTER SPECIALISTS, TEACHER EDUCATORS, SUPERVISORS, AND TEACHERS TO PROVIDE INFORMATION ON LIGHT HORSE BREEDS, SELECTION, NUTRITION, CARE, AND FACILITIES. TEACHERS SHOULD HAVE COMPETENCY IN GENERAL AGRICULTURE, AND STUDENTS SHOULD HAVE AVERAGE ABILITY, INTEREST IN, AND AN OCCUPATIONAL GOAL OF MANAGING LIGHT HORSES. THE MATERIAL CAN BE USED AS EITHER A TEXT OR REFERENCE ASSIGNMENT REQUIRING ONE TO FOUR HOURS. THE DOCUMENT IS ILLUSTRATED WITH PHOTOGRAPHS AND DRAWINGS. THIS DOCUMENT IS AVAILABLE FOR 20 CENTS FROM VOCATIONAL AGRICULTURE SERVICE, 434 MUMFORD HALL, UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS 61801. (JM)

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SELECTING, FEEDING, AND CARING FOR LIGHT HORSES

Horses may be classified as light horses, ponies, or draft horses, according to their size, build, and use.

Light horses stand 14-2 to 17 hands high,* weigh 900 to 1,400 pounds, and are used primarily for riding, driving, or racing, or for utility purposes on the farm. Light horses are usually more rangy and capable of more action and greater speed than draft horses.

Ponies stand under 14-2 hands high and weigh 300 to 900 pounds.

Draft horses stand 14-2 to 17-2 hands high, weigh 1,400 pounds or more, and are used primarily for pulling loads and other heavy work.

1. BREEDS OF LIGHT HORSES AND THEIR CHARACTERISTICS

Some of the light-horse breeds, common to Illinois, are included here. Characteristics of the lesser common breeds may be found in some of the horse publications or from the respective breed associations.

American Saddle Horse (Fig. 1)

Animals of this breed furnish an easy ride with great style and animation. They may be either three or five gaited. Three-gaited horses, by custom, are shown with their manes roached, or clipped short, and the upper part of their tails clipped or sheared close. Five-gaited horses, by custom, are shown with flowing manes and full-length tails. Most of them are 15 to 16 hands high and weigh 1,000 to 1,200 pounds. This breed is noted for a beautiful head carried on a long, graceful neck; short, rounded back; level croup; high-set tail; and proud action.

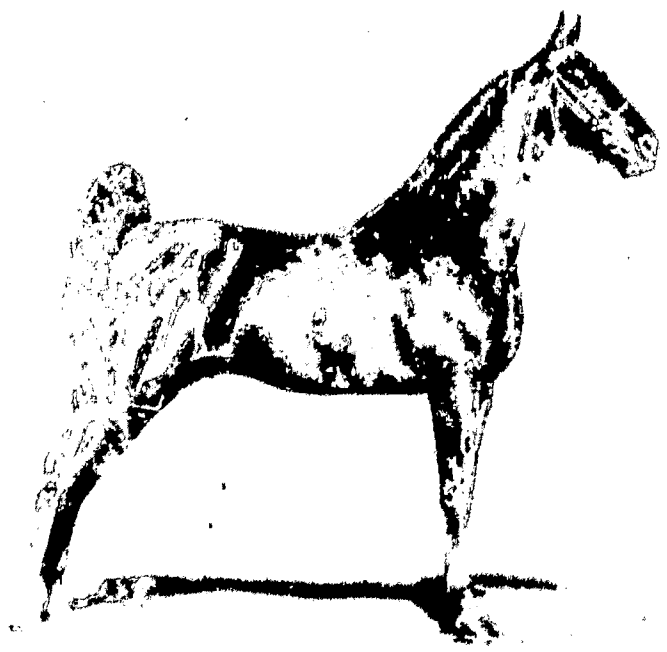

Fig. 1. American Saddle Horse stallion

Arabian (Fig. 2)

Distinctive characteristics of the Arabian breed are medium to small size, beautiful head, short coupling, docility, great endurance, and a gay way of going. The usual height is 14 to 15-1 hands and the weight, 850 to 1,100 pounds. The breed is used primarily for saddle, show, and stock purposes.

*A "hand" is 4 inches. The measurement is taken from the highest point of the withers to the ground when the animal is standing squarely on a level area. A horse measuring 62 inches is said to be 15-2 hands high (15 hands and 2 inches).

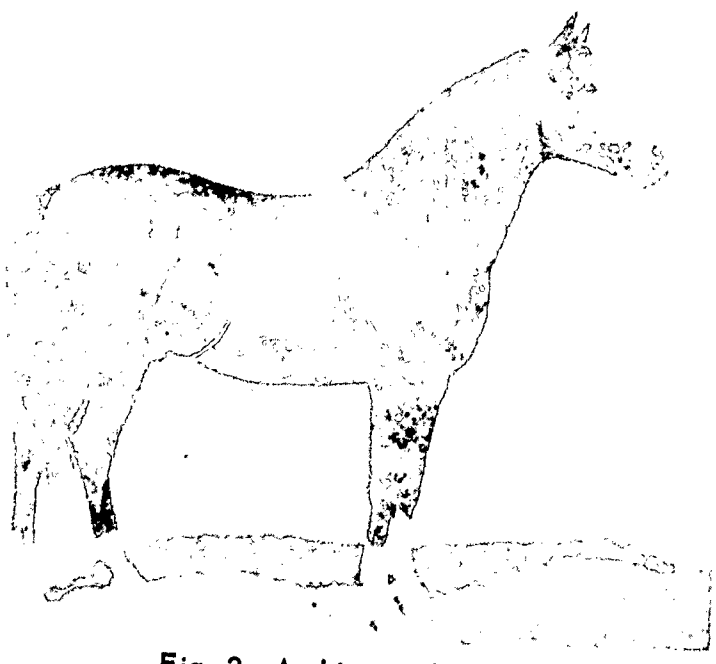

Fig. 2. Arabian stallion

Hackney (Fig. 3)

High natural action is a distinguishing feature of this breed. The Hackney varies more in size than any other breed, ranging from 12 to 16 hands high; the Hackney pony should not exceed 14-2 hands. The Hackney was bred to be a heavy harness horse—a large light horse used for pulling carriages. It has become essentially a show animal. In the show ring, it is customary that heavy harness horses be docked and have their manes pulled.

Fig. 3. Hackney stallion

Morgan (Fig. 4)

The Morgan is an American breed that was developed in New England from the stallion Justin Morgan. Very little, unfortunately, is known of his ancestry.

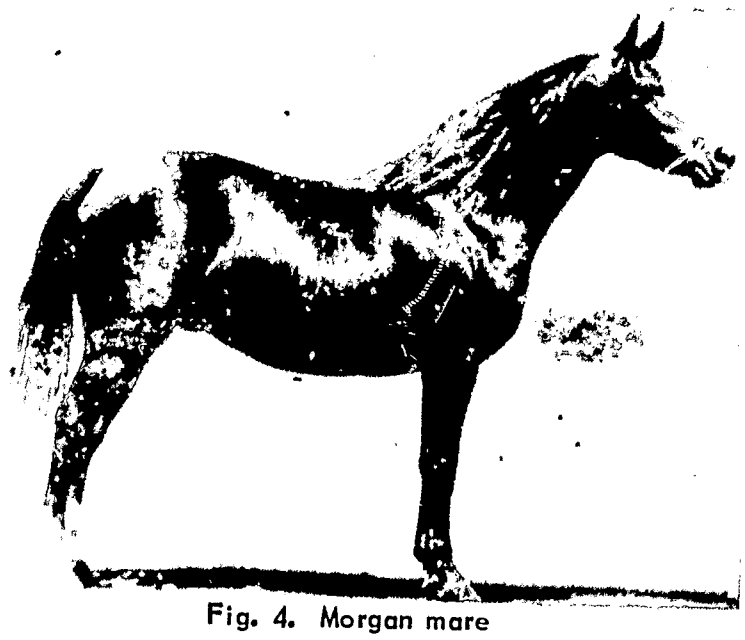

Fig. 4. Morgan mare

This breed always has been noted for smooth trim lines, good style, easy-keeping qualities, sturdiness, endurance, and docility—the last without sacrifice of spirit and courage. The average height is 15-2 hands and the average weight is 1,050 pounds. Representative animals of the breed, however, may range from 14-2 to 16 hands in height and from 800 to 1,200 pounds in weight.

Palomino (Fig. 5)

Palomino horses must be golden in color and have light-colored manes and tails. White markings on the face or below the knees or hocks are acceptable. The preferred height is 14-2 to 16 hands and the preferred weight, 1,000 to 1,200 pounds.

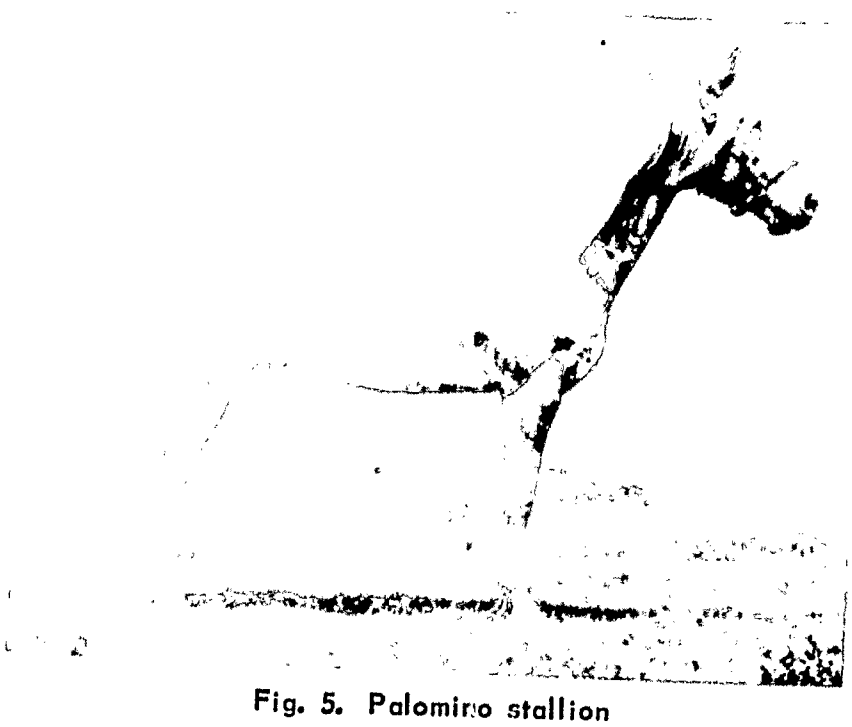

Fig. 5. Palomino stallion

Genetic studies of the Palomino indicate that the color is probably unfixable—that is, it cannot be made true through breeding—no matter how long or how persistent the effort.

Quarter Horse (Fig. 6)

Quarter horses are stout in build, but should not be the extreme "bulldog" type. They seldom exceed 15 hands in height; they weigh 1,000 to 1,200 pounds. The head is somewhat short and is distinctive because of the small, alert ears and heavily muscled cheeks and jaw. Their build makes them ideal stock horses—agile and speedy animals that have enough weight and power to hold heavy steers that have been roped. They have a calm disposition even during a roundup.

Certain families are being selected for great speed at short distances and are being used primarily for racing.

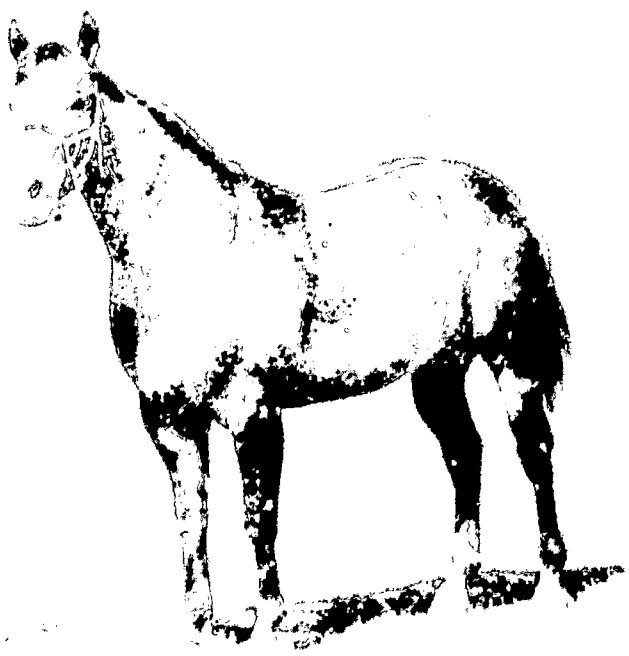

Fig. 6. Quarter Horse stallion

Shetland Pony (Fig. 7)

While ponies are normally classified in a class by themselves, this one breed will be described briefly in this light-horse publication.

Shetland Ponies are less than 11-2 hands in height—most are less than 10-2 hands. There are two distinct types—one resembles a small draft horse and the other a small road-type horse. They may be almost any of the horse colors, both broken and solid. Shetland Ponies are noted for their good dispositions.

Fig. 7. Shetland Pony stallion

Standardbred (Fig. 8)

While animals of this breed are generally smaller, longer bodied, less leggy, and less refined than Thoroughbreds, they show more substance and ruggedness and have more docile dispositions. They range in weight from 900 to 1,300 pounds, and in height from 15 to 16 hands.

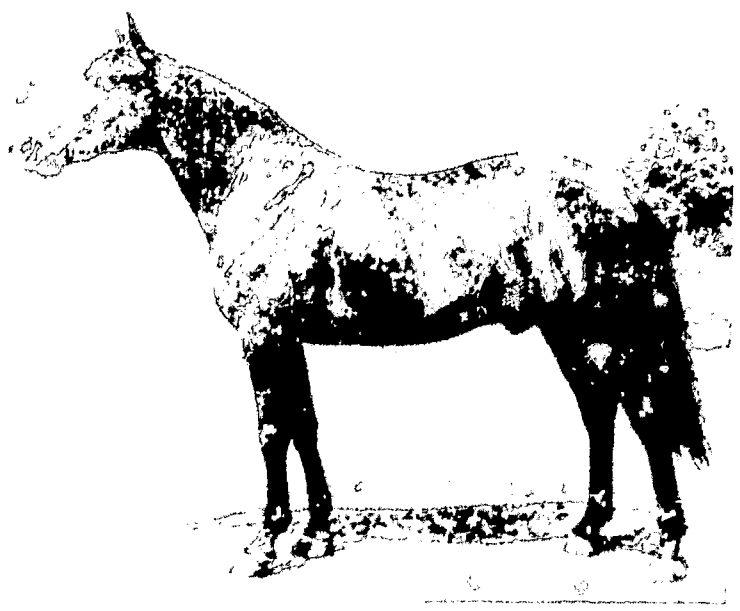

Fig. 8. Standardbred stallion

Thoroughbred (Fig. 9)

Thoroughbreds possess a high degree of quality and refinement and are built for speed. Their bodies are long, deep chested, rather narrow, upstanding, and often a bit angular. They are active, energetic, and nervous. They are 15 to 17 hands high. In racing trim, Thoroughbreds may weigh 900 to 1,025 pounds; stallions in breeding condition may weigh up to 1,400 pounds or more.

Fig. 9. Thoroughbred stallion

2. WHAT SHOULD I LOOK FOR WHEN SELECTING LIGHT HORSES?

Horses, like other classes of livestock, may be selected on type, pedigree, and/or performance or progeny testing. While the latter two are very important for certain uses, the emphasis in this publication will be on type alone.

When selecting on type, you should know the names of the parts of a horse (Fig. 10),

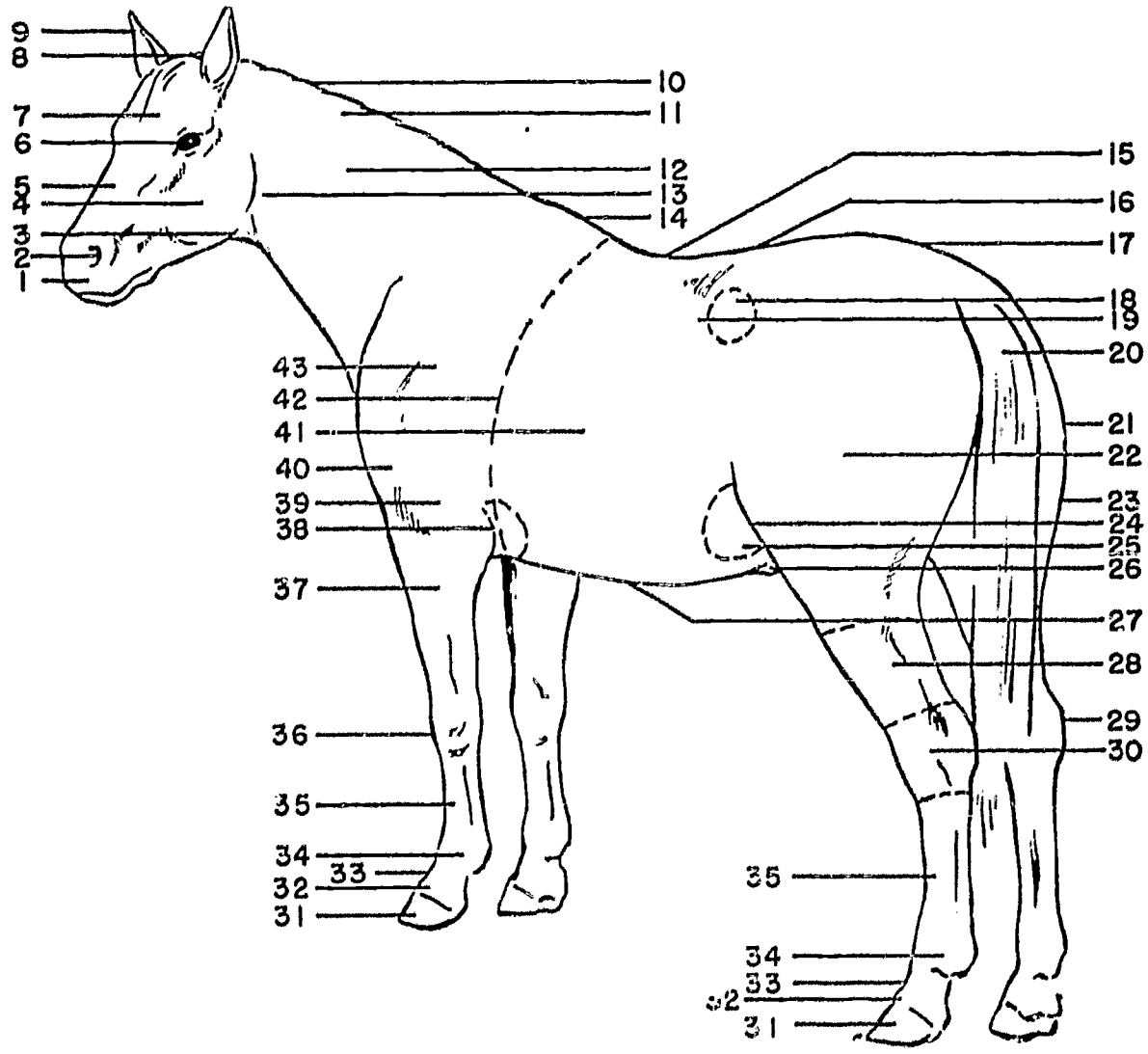

Fig. 10. Parts of a horse. (1) Muzzle, (2) Nostril, (3) Jaw, (4) Cheek, (5) Face, (6) Eye, (7) Forehead, (8) Poll, (9) Ear, (10) Mane, (11) Crest, (12) Neck, (13) Throatlach, (14) Wither, (15) Back, (16) Loin, (17) Croup, (18) Hip, (19) Coupling, (20) Tail, (21) Point of the buttocks, (22) Thigh, (23) Quarter, (24) Stifle, (25) Rear flank, (26) Sheath, (27) Underline, (28) Gaskin, (29) Point of hock, (30) Hock, (31) Foot, (32) Coronet, (33) Pastern, (34) Fetlock, (35) Cannon, (36) Knee, (37) Forearm, (38) Point of elbow, (39) Arm, (40) Point of shoulder, (41) Ribs, (42) Heart girth, (43) Shoulder.

have in mind an image of the ideal-type animal, and be able to compare your animal with the ideal. Some of the characteristics of the ideal type, as well as some of the common faults, are given in Table 1.

Other items to be considered along with type are gaits and certain blemishes and unsoundnesses.

Gaits

A gait is a natural or acquired way of walking or running, characterized by a distinctive rhythmic movement of the feet and legs.

The gaits of light horses, especially show and racing stock, are very important. Three-gaited horses may include the walk, trot, and gallop or the walk, trot, and canter, depending upon the type of horse. Five-gaited horses must perform two additional gaits. A brief description of the most common gaits are as follows:

Walk is a slow, natural gait of four beats in which each foot leaves and strikes the ground at separate intervals (Fig. 11). The walk should be springy, regular, and true.

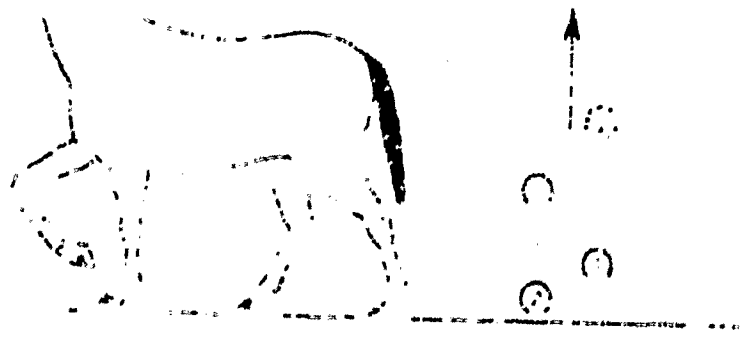

Fig. 11. The walk is the natural, slow gait of horses.

Trot is a rapid, natural two-beat diagonal gait in which the front foot and the opposite hind foot take off together and strike the ground simultaneously (Fig. 12).

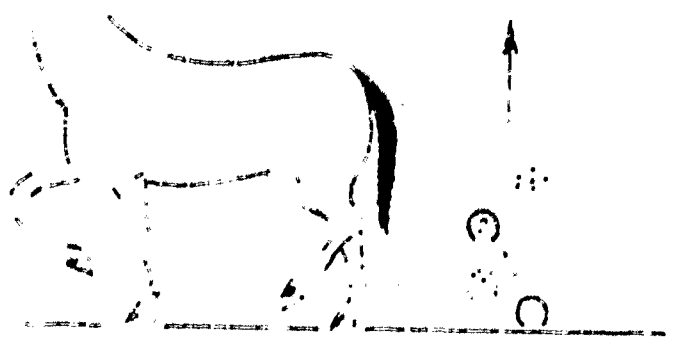

Fig. 12. The trot is the natural, rapid gait of horses.

All four feet are off the ground at the same time for a brief moment, making the horse seem to float through the air.

This gait varies considerably with different breeds. The trot of the Standardbred is characterized by length and rapidity of individual strides, while that of the Hackney shows extreme flexion of the knees and hocks that produces a high-stepping show gait.

Run or gallop is a fast, three-beat gait during which two diagonal legs are paired and strike the ground together between the successive beats of the other two unpaired legs (Fig. 13). All four feet are off the ground for a brief interval. The two unpaired legs that act independently—the forefoot with which the horse leads and the diagonal hindfoot—naturally bear more weight and are subject to more fatigue than the paired legs that act jointly.

In the gallop, propulsion is chiefly in the hindquarters, although the forequarters sustain a tremendous jar as the horse lands. The gallop is the fast natural gait of horses.

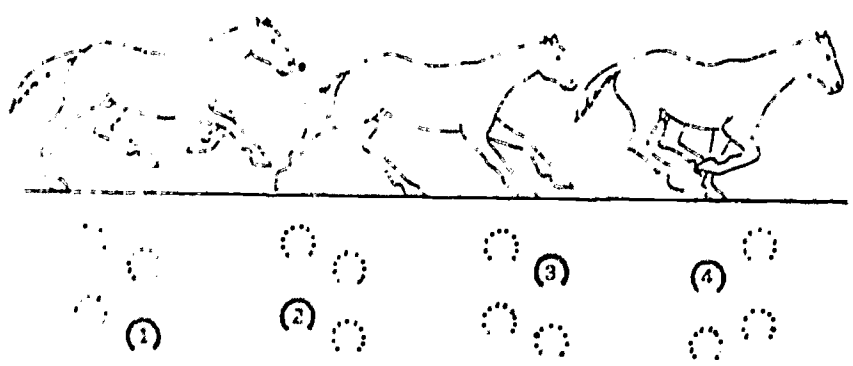

Fig. 13. The gallop is the natural, fast, three-beat gait of horses.

Canter is a slow, restrained gallop or run (Fig. 14). Like the gallop, it is a three-beat gait, and it puts unusual wear on the leading forefoot and its diagonal hindfoot. It is impor-

Fig. 14. The canter is a slow, restrained gallop.

Table 1. Light Horse Selection Guide

What to look for	Ideal type	Common faults
Front view:		
1. Head	1. Head well proportioned to rest of body, refined, clean cut, with chiseled appearance; broad, full forehead with great width between eyes; jaw broad and strongly muscled; eyes medium size, well carried, and attractive.	1. Plain headed; weak jaw.
2. Femininity or masculinity	2. Refinement and femininity in brood mare; boldness and masculinity in stallion.	2. Mares lacking femininity; stallion lacking masculinity.
3. Chest capacity	3. Deep, wide chest	3. Narrow chest.
4. Set of front legs	4. Straight, true, and squarely set front legs	4. Crooked front legs.
Rear view:		
1. Width of croup and through rear quarters.	1. Wide and muscular over croup and through rear quarters.	1. Lacking width and length over croup and muscling through rear quarters.
2. Set of hind legs	2. Straight, true, and squarely set hind legs	2. Crooked hind legs.
Side view:		
1. Style and beauty	1. High carriage of head, active ears, alert disposition, and beauty of conformation.	1. Lacking style and beauty.
2. Balance and symmetry	2. All parts well developed and nicely blended together	2. Lacking in balance and symmetry.
3. Neck	3. Fairly long neck, carried high; clean cut about throat latch; with head well set on.	3. Short, thick neck; ewe necked.
4. Shoulder	4. Sloping shoulders (about a 45° angle)	4. Straight in shoulders.
5. Topline	5. Short, strong back and loin, with long, nicely turned and heavily muscled croup, and high, well-set tail; withers clearly defined and of same height as high point over croup.	5. Sway backed; steep croup.
6. Coupling	6. A short coupling as denoted by last rib being close to hip.	6. Long in coupling.
7. Middle	7. Ample middle due to long, well-sprung ribs	7. Lacking middle.
8. Rear flank	8. Well let down in rear flank	8. High cut rear flank or "wasp waisted."
9. Arm, forearm, and gaskin	9. Well-muscled arm, forearm, and gaskin	9. Light-muscled arm, forearm, and gaskin.
10. Legs, feet, and pasterns	10. Straight, true, and squarely set legs; pasterns sloping about 45°; hoofs large, dense, and wide at heels.	10. Crooked legs; straight pasterns; hoofs small, shelly, and contracted at heels.
11. Quality	11. Plenty of quality, as denoted by clean, flat bone, well-defined joints and tendons, refined head and ears, and fine skin and hair.	11. Lacking quality.
12. Breed type (size, color, shape of body and head, and action) true to breed represented.	12. Showing plenty of breed type	12. Lacking breed type.
Soundness:		
1. Soundness and freedom from defects in conformation that may predispose unsoundness.	1. Sound and free from blemishes	1. Unsound; blemished (wire cuts, curbs, hocks).
Action:[1]		
1. At walk	1. Easy, prompt, balanced; a long step, with each foot carried forward in a straight line; feet lifted off ground.	1. Short step, with feet not lifted off ground.
2. At trot	2. Rapid, straight, elastic trot with joints well flexed	2. Winging, forging, and interfering.
3. At canter	3. Slow, collected canter, which is readily executed on either lead.	3. Fast and extended canter.

[1] The 3 most common gaits are given here. Five gaited horses must perform 2 additional gaits. In selecting for gait, (1) observe horse at each intended gait, and (2) examine trained horses while performing at use for which they are intended.

tant to frequently change the lead. A well-trained horse will do this easily at the will of the rider.

In the show ring, the lead should be toward the inside of the ring, and the lead is changed by reversing direction of travel (when the ringmaster calls for "reverse and canter"). This gait should be executed in such a slow collected manner that the animal may perform in a relatively small circle.

Pace is a fast two-beat gait in which the front and hind feet on the same side start and stop together (Fig. 15). The feet rise just above the ground level. All four feet are off the ground for a split second and the horse appears to float forward.

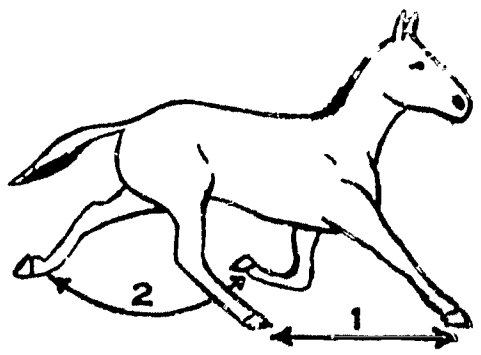

Fig. 15. The pace is a fast, two-beat gait.

The pace is faster than the trot but slower than the run or gallop. It allows for a "quick getaway" but it produces an objectionable side or rolling type of motion. This gait is not suited to travel in mud or snow; a smooth, hard footing and easy draft are necessary for its best execution.

The pace once was popular in England but lost in favor soon after the development of the Thoroughbred early in the eighteenth century.

Rack is a fast, brilliant, flashy, unnatural, four-beat gait in which each foot strikes the ground separately at equal intervals; known originally as the "single foot." The rack is easy on the rider but hard on the horse. It is, undoubtedly, the most popular and flashy gait in the American show ring. On the tanbark, greater speed at the rack is requested with the command "rack on."

Defects in movement

The feet of a horse should move straight ahead parallel to an imaginary center line drawn in the direction of travel. Any movement other than this may be considered a defect.

Some defects are:

Cross-firing. A "scuffing" on the inside of the diagonal forefeet and hindfeet. This is generally confined to pacers.

Dwelling. A noticeable pause in the flight of the foot, as though the stride was completed before the foot reaches the ground. This is most noticeable in trick-trained horses.

Forging. Striking forefoot with toe of hindfoot.

Interfering. Striking fetlock or cannon with the opposite foot. This is most often done by base-narrow, toe-wide, or splay-footed horses.

Lameness is a defect noticeable by an animal favoring an affected foot when standing. The animal also attempts to ease the load on the ailing foot in walking and the characteristic bobbing of the head occurs as the affected foot strikes the ground.

Paddling is the throwing the front feet outward as they are picked up. This is most common in toe-narrow or pigeon-toed horses.

Pounding is a heavy contact with the ground instead of desired light, springy movement.

Rolling is an excessive lateral shoulder motion, characteristic of horses with protruding shoulders.

Scalping. The hairline at top of hindfoot hits toe of forefoot as it breaks over.

Speedy cutting. The inside of diagonal fore and hind pastern make contact, as sometimes seen in fast-trotting horses.

Stringhalt. Excessive flexing of hind legs. This is most easily detected when a horse is backed.

Trappy. A short, quick, choppy stride. This is a tendency of horses with short, straight pasterns and straight shoulders.

Winging is an exaggerated paddling, particularly noticeable in high-going horses.

Blemishes and unsoundnesses

Anything abnormal about the body or movement of a horse may be considered an unsound-

ness. From a practical standpoint, however, abnormalities may be divided between those that do and those that do not affect serviceability.

Blemishes include the abnormalities that do not affect serviceability—such as wire cuts, rope burns, nail punctures, shoe boils, or capped hocks.

Unsoundnesses include more serious abnormalities that affect serviceability. Fig. 16 shows the location of common blemishes and unsoundnesses.

Consider the use to which you intend to put the animal before you buy a blemished or unsound horse.

Stable vices

Stable vices are bad habits of the horse in confinement. They may detract from the value of the animal.

Cribbing. A horse that bites or sets his teeth against the manger or some other object while sucking air is said to be cribbing. This causes hard keeping and a bloated appearance. Horses with this vice are subject to colic.

A common remedy for cribbing is a strap buckled snugly around the horse's neck in a way that will compress the larynx when the head is flexed, but that will not cause any discomfort when the horse is not indulging in the vice.

Halter pulling. This term is applied to a tied horse that pulls back on its halter rope.

Kicking. A true stable kicker apparently kicks just for the satisfaction it gets out of striking something with its hind feet. Unusual excitement or injury may cause a gentle horse to kick.

Tail rubbing. Persistent rubbing of the tail against the side of the stall or some other object is objectionable. Parasites, such as lice or rectal worms, may cause this. A "tail board" or parasite control helps break animals of this habit. A tail board is a board projecting from the wall of the stall high enough to strike just below the point of the buttock, instead of the tail, of the rubbing horse.

Bolting. Horses that eat too rapidly are said to be "bolting." This can be controlled by adding chopped hay to the animal's grain ration, or by putting stones as big as baseballs in its feed box.

Weaving. A horse's rhythmic swaying back and forth while standing in the stall is known as weaving.

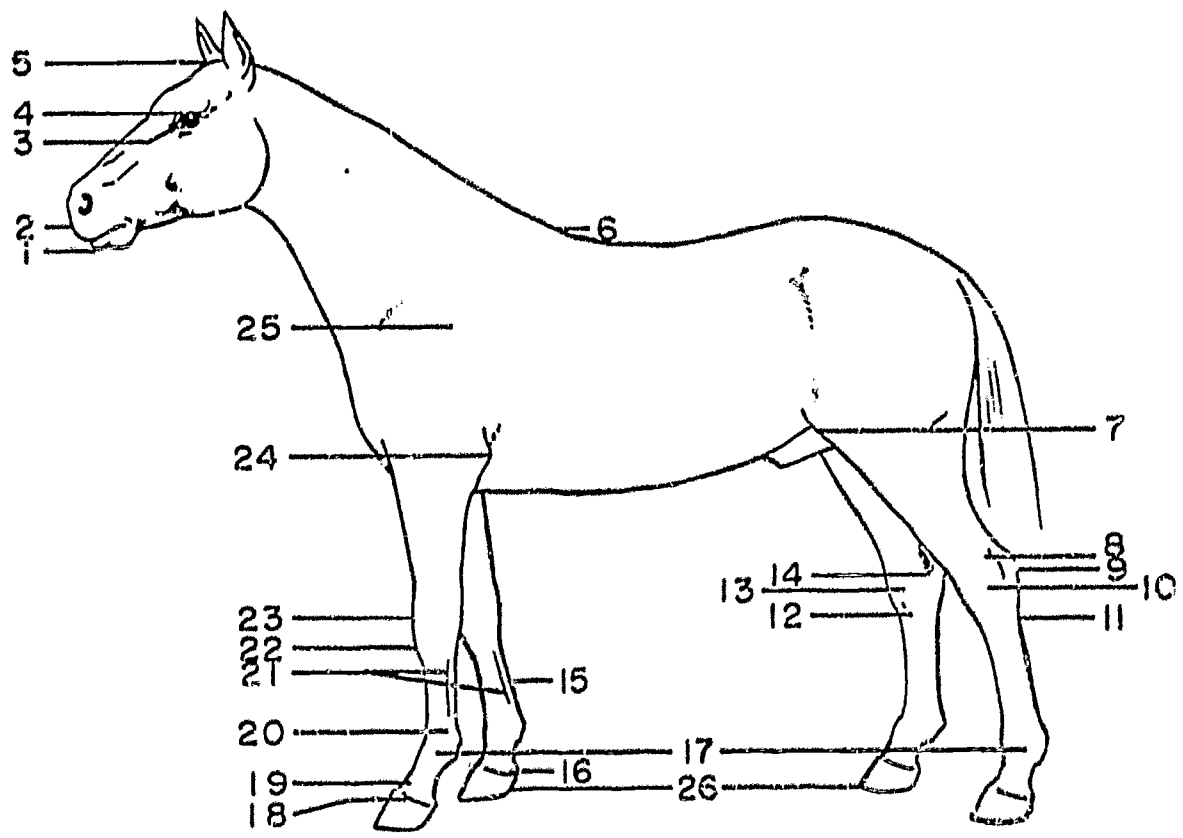

Fig. 16. Common unsoundnesses in horses. (1) Undershot jaw, (2) Parrot mouth, (3) Blindness, (4) Moon blindness, (5) Poll evil, (6) Fistulous withers, (7) Stifled, (8) Thoroughpin, (9) Capped hock, (10) Stringhalt, (11) Curb, (12) Bone spavin or jack, (13) Bog spavin, (14) Blood spavin, (15) Bowed tendons, (16) Sidebones, (17) Cocked ankles, (18) Quitter, (19) Ring bone, (20) Windpuffs, (21) Splints, (22) K ee sprung, (23) Calf kneed, (24) Capped elbow, (25) Sweeney, (26) Contracted feet, corns, founder, thrush, quarter or sand crack, scratches, or grease heel, (General) Heaves, hernia, roaring, or thick wind.

Other vices. Other vices that may be difficult to cope with, especially in older animals, are: balking, backing, rearing, shying, striking with the front feet, a tendency to run away, and objecting to harnessing, saddling, or grooming. Many of these bad habits are caused by incompetent handling, however.

3. HOW SHOULD I FEED LIGHT HORSES?

Feeding practices vary from one locality to another—and even among horsemen. The size of individual horses, the use to which they are put, and the size of the enterprise also makes a difference.

Feeds

Because horses have small digestive tracts, they cannot eat as much roughage as cattle. Feeds should be selected that will provide energy but not add surplus body weight or large, paunchy stomachs.

A light-horse feeding guide is given in Table 2. In selecting rations, compare them with commercial feeds. If you use small quantities or have little storage room, you may find it more satisfactory to buy ready-mixed feeds.

More than one kind of hay makes for variety and appetite appeal. In season, any good pasture can replace part or all of the hay unless work or training conditions make substitution impractical.

Good-quality oats and timothy hay have always been considered standard feeds for light horses. Feeds of similar nutritive properties can be interchanged in the ration as price relationships warrant. This makes it possible to obtain a balanced ration at lowest cost. Some of these feeds are grains (oats, corn, barley, wheat, and sorghum), protein supplements (linseed meal, soybean meal, and cottonseed meal), and hays of many varieties.

During winter months, add a few sliced carrots to the suggested ration, an occasional bran mash, or a small amount of linseed meal. Also, use bran mash or linseed meal to regulate the bowels.

The proportion of concentrates should be increased and the roughages decreased as energy needs rise with the greater amount, severity, or speed of work. A horse that works at a trot needs considerably more feed than one that works at a walk. For this reason, draft animals that perform most of their work at a walk, require somewhat less grain and more hay in proportion to body weight than light horses that travel faster. Also, from an esthetic standpoint, large stomachs that result from high roughage rations are less objectionable on draft animals than on light horses.

The rations given in Table 2 are suited equally to light horses, draft horses, and mules. For light horses, use the upper limits of grain and the lower limits of hay. Keep the total allowance of concentrates and hay within the range of 2.0 to 2.5 pounds daily per 100 pounds live weight.

Minerals

The common horse ration of grass, grass hay, and farm grains is usually deficient in calcium, but adequate in phosphorus. Also, salt is almost always deficient, and many horse rations do not contain sufficient iodine. Thus, horses usually need special mineral supplements.

On the average, a horse will consume about 3 ounces of salt daily or 1 1/3 pounds per week, although the salt requirements vary with work and temperature.

The salt requirements, and any calcium or phosphorus requirements not met by feeds, can best be supplied by allowing free access to a two-compartment box containing minerals. One compartment should have salt (iodized in iodine-deficient areas), and the other should contain a mixture of 2 parts steamed bone meal (or other calcium-phosphorus supplement) and 1 part salt (the salt is for palatability). It is important, however, that the Ca/P ratio of horse rations be maintained at not less than 1:1. Narrower ratios may cause osteomalacia (softening of the bones) in mature

Table 2. Light Horse Feeding Guide

Age, sex, and use	Daily allowance	Kind of hay	Suggested grain rations		
			Rations No. 1	Rations No. 2	Rations No. 3
Stallions in breeding season (weighing 900 to 1,400 pounds).	¾ to 1½ pounds grain per 100 pounds live weight, together with a quantity of hay within same range.	Grass-legume mixed; or ⅓ to ½ legume hay, with remainder grass hay.	*Pounds* Oats 55 Wheat 20 Wheat bran 20 Linseed meal 5	*Pounds* Corn 35 Oats 35 Wheat 15 Wheat bran 15	*Pounds* Oats (alone).
Pregnant mares (weighing 900 to 1,400 pounds).	¾ to 1½ pounds grain per 100 pounds live weight, together with a quantity of hay within same range.	Grass-legume mixed; or ⅓ to ½ legume hay, with remainder grass hay (straight grass hay may be used first half of pregnancy).	Oats 80 Wheat bran 20	Barley 45 Oats 45 Wheat bran 10	Oats 95 Linseed meal 5
Foals before weaning (weighing 100 to 350 pounds with projected mature weights of 900 to 1,400 pounds).	½ to ¾ pound grain per 100 pounds live weight, together with a quantity of hay within same range.	Legume hay.	Oats 50 Wheat bran 40 Linseed meal 10	Oats 30 Barley 30 Wheat bran 30 Linseed meal 10	Oats 80 Wheat bran 20
			Rations balanced on basis of following assumption: Mares of mature weights of 600, 800, 1,000, and 1,200 pounds may produce 36, 42, 44, and 49 pounds of milk daily.		
Weanlings (weighing 350 to 450 pounds).	1 to 1½ pounds grain and 1½ to 2 pounds hay per 100 pounds live weight.	Grass-legume mixed; or ⅓ to ½ legume hay, with remainder grass hay.	Oats 30 Barley 30 Wheat bran 30 Linseed meal 10	Oats 70 Wheat bran 15 Linseed meal 15	Oats 80 Linseed meal 20
Yearlings, 2d summer (weighing 450 to 700 pounds).	Good, luxuriant pastures (if in training or for other reasons without access to pastures, the ration should be intermediate between the adjacent upper and lower groups).				
Yearlings, or rising 2-year-olds, 2d winter (weighing 700 to 1,000 pounds).	½ to 1 pound grain and 1 to 1½ pounds hay per 100 pounds live weight.	Grass hay.	Oats 80 Wheat bran 20	Barley 35 Oats 35 Bran 15 Linseed meal 15	Oats (alone).
Light horses at work; riding, driving, and racing (weighing 900 to 1,400 pounds).	*Hard use.*—1¼ to 1⅓ pounds grain and 1 to 1¼ pounds hay per 100 pounds live weight. *Medium use.*—¾ to 1 pound grain and 1 to 1¼ pounds hay per 100 pounds live weight. *Light use.*—⅖ to ½ pound grain and 1 to 1¼ pounds hay per 100 pounds live weight.	Grass hay.	Oats (alone).	Oats 70 Corn 30	Oats 70 Barley 30
Mature idle horses; stallions, mares, and geldings (weighing 900 to 1,400 pounds).	1½ to 1¾ pounds hay per 100 pounds live weight.	Pasture in season; or grass-legume mixed hay.	(With grass hay, add ¾ pound of a high protein supplement daily.)		

Note: With all rations and for all classes and ages of horses, provide free access to separate containers of (1) salt (iodized salt in iodine-deficient areas) and (2) a mixture of 1 part salt and 2 parts steamed bone meal or other suitable calcium-phosphorus supplement.

horses. The latter condition may develop when rations with a Ca/P ratio of 0.8 to 1 are fed 6 to 12 months, and it will progress rapidly when the ratio is 0.6 to 1.

A good commercial mineral mixture may be fed if desired.

Vitamins

Certain vitamins are necessary to the growth, development, health, and reproduction of horses. The vitamins most commonly deficient are A and D. Also, indications are that vitamin E and some of the B vitamins (riboflavin and perhaps thiamine) are required by the horse. While these are all necessary for proper health, vitamin deficiencies in horses are the exception rather than the rule.

High-quality, leafy, green forages plus plenty of sunshine usually gives horses all the vitamins they need. Horses get carotene (which the animal can convert to vitamin A) and riboflavin from green pasture, (not over a year old), and grass or legume silage. They get vitamin D from exposure to sunlight, and from feeding on sun-cured hay.

Severe deficiency of vitamin A may cause night blindness, reproductive difficulties, poor or uneven hoof development, respiratory symptoms, and incoordination. There is also some evidence that deficiency of this vitamin may cause or contribute to certain leg bone weaknesses. When any of the deficiency symptoms appear, add dehydrated alfalfa or grass or a vitamin A supplement to the ration.

A deficiency in vitamin D, calcium, or phosphorus may cause rickets in foals. This can be prevented by exposing the animal to direct sunlight as much as possible, by allowing it free access to a suitable mineral mixture, or by providing it good-quality, sun-cured hay or lush pasture grown on well-fertilized soils. In northern areas lacking in adequate sunshine, many horsemen add a vitamin D supplement, such as cod liver oil or irradiated yeast, to the foals' ration.

Horses seem to require vitamin E, but most practical rations contain sufficient quantities of it. Rather than buy and use costly vitamin E concentrates because of a possible deficiency, add them to the ration only on the advice of a competent nutritionist or veterinarian.

Under some conditions, there is evidence that alpha tocopherol succinate (a relatively stable form of vitamin E) is effective in (1) increasing the conception rate of mares; (2) improving the breeding behavior, sex drive, sperm quality, and condition of stallions; and (3) improving the stamina, temperament, feed consumption, and track performance of racehorses. Where needed, the recommended daily doses of alpha tocopherol succinate in the feed are: Stallions and brood mares, 600 to 1,000 I.U. beginning a few weeks before breeding; and racehorses in training, 2,000 I.U.

A deficiency of riboflavin may cause moon blindness (periodic ophthalmia), but this is not the only factor in producing the condition (sometimes moon blindness follows leptospirosis in horses). Prevent moon blindness, caused by lack of riboflavin, by feeding green hays and green pastures, feeds high in riboflavin, or by adding crystalline riboflavin to the ration at the rate of 40 mg. per horse per day. A thiamine deficiency has been observed in horses fed on poor-quality hay and grain. Although thiamine is synthesized in the lower gut, the amount absorbed may not always meet the full requirements. Other vitamins of the B complex may be essential. Healthy horses usually get enough of them either in natural rations or by synthesis in the intestinal tract, primarily the caecum. When neither green pasture nor high-quality dry roughage is available, B vitamins may be provided by adding distiller's dried solubles, dried brewer's yeast, or animal liver meal to the ration.

Water

Horses should have ample quantities of clean, fresh, cool water. They will drink 10 to 12 gallons daily—the amount depending on the weather, amount of work done, and rations fed.

Free access to water is desirable. When this is not possible, water horses at approximately the same time each day.

Opinions vary as to the proper time and method of watering horses, but all agree that regularity and frequency are desirable. Most horsemen, however, agree that water may be given either before, during, or after feeding.

Frequent, small waterings between feedings are desirable during warm weather, or when the animal is being put to hard use. Do not allow a horse to drink heavily when he is hot, because he may founder. Do not allow a horse to drink a large amount of water just before going to work.

Pastures

Good pasturage is the cornerstone of successful horse production. Great horse-breeding centers are characterized by lush pastures produced on fertile soils. In season, there is no finer forage for horses.

A temporary pasture grown in a regular crop rotation is preferable to a permanent pasture that may be parasite infested.

Since horses are less likely to bloat than cattle or sheep, legume pastures are excellent for them. Specific grass or grass-legume mixtures vary widely from one area to another according to differences in soil, temperature, rainfall, and other natural factors.

Be sure horse pastures are well drained, that shade, water, and minerals are available, and that pits, stumps, poles, tanks, and places dangerous to horses are guarded.

4. WHAT CARE SHOULD I GIVE LIGHT HORSES?

Care of the feet

The value of a horse lies chiefly in its ability to move—hence the saying, "No foot, no horse." The important points in the care of a horse's feet are to keep them clean, prevent them from drying out, and trim them so they retain proper shape and length. The names of the parts of a horse's foot are shown in Fig. 17.

Clean the horse's feet regularly, with the hoof pick. Work from the heel toward the toe. Be sure to clean out the depressions between the frog and bars. While you are cleaning the feet, also inspect for loose shoes and thrush. Thrush is a disease of the foot, characterized by a pungent odor. It causes a softening of tissues in the cleft of the frog or in the junction between the frog and bars. This disease produces lameness and, if not treated, can be serious.

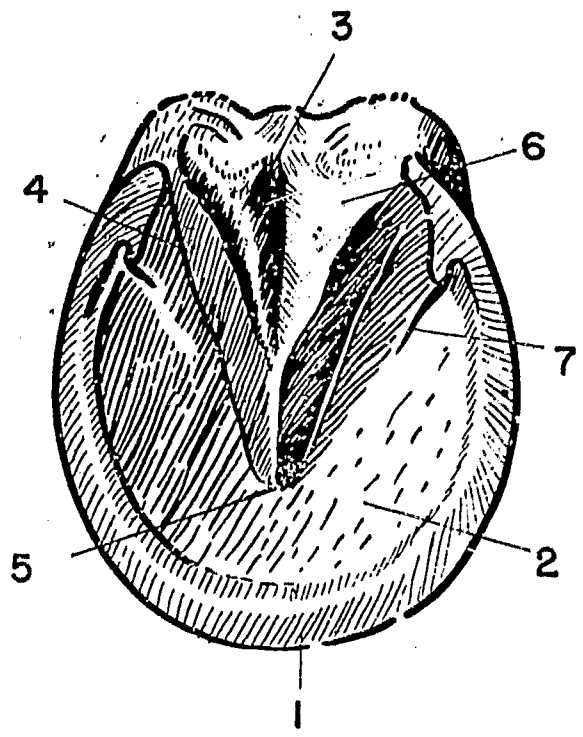

Fig. 17. The parts of the foot of the horse are: (1) Bearing edge of the hoof-wall. (2) Sole. (3) Median furrow of the frog. (4) Lateral Furrow of the frog. (5) Apex of the frog. (6) Branch of the frog. (7) Bar.

Hoofs which occasionally become dry and brittle, may split and produce lameness. The frog loses its elasticity and is no longer effective as a shock absorber. If the dryness is prolonged, the frog shrinks in size and the heel contracts. Prevent such drying by wetting the ground around the watering tank. If the hoofs of a shod horse become too dry, either pack them in wet clay once or twice a week after the horse has been used or attach burlap sacks around them. Keep the sacks moistened. A leather sole with tar and oakum packing beneath it may be used unless the horse travels over cinders. After the hoof has absorbed enough moisture, brush on a hoof dressing, such as neat's-foot oil, sweet oil, or linseed oil. Remove the oil before soaking again.

Trim the feet so that the horse stands square and plumb. This will prevent strain on the tendons and help prevent deformity, improper action, and unsoundness.

The healthy hoof grows 3/8 to 1/2 inch per month. If the hoof is not trimmed, the

wall will break off and will not wear evenly. To prevent this, trim the hoofs regularly, about once a month, whether the horse is shod or not. Use nippers to trim off the horn. Then, level the wall with a rasp.

Fig. 18 shows the proper posture of the hoof and incorrect postures caused by hoofs grown too long either in toe or heel. The slope is considered normal when the toe of the hoof and the pastern have the same direction. This angle should be kept always in mind and changed only as a corrective measure. If it should become necessary to correct uneven wear of the hoof, correct gradually over a period of several trimmings.

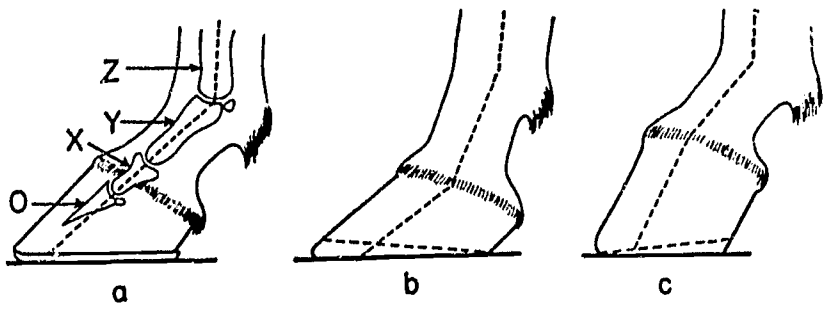

Fig. 18. (a) Hoof that is properly trimmed with a normal food axis: O is coffin bone; X is short pastern bone; Y is long pastern bone; and Z is cannon bone. (b) Toe is too long, causing the foot axis to break backward. (c) Heel is too long, causing the foot axis to break forward.

Trim the hoof near the level of the sole. Otherwise, it will split off if the horse remains unshod. Trim the frog carefully. Remove any ragged edges that might allow filth to accumulate in the crevices. Trim the sole sparingly, if at all.

Never rasp the walls of the hoof. This removes the periople, or thin varnishlike outer layer provided by nature as a protective coating that prevents evaporation.

Shoe horses to be used on hard surfaces to prevent the wall from wearing down to the sensitive tissues beneath. A correctly shod horse is a more efficient performer. Shoes may be used to change gaits and action, to correct faulty hoof structure or growth, and to protect the hoof itself from such conditions as corns, contraction, or cracks.

Racing "plates" are used on running horses to aid in gripping the track.

Reshoe or reset shoes at 4- to 6-week intervals. Shoes that are left on too long, may cause the hoofs to grow out of proportion. This may throw the horse off balance.

An unshapely hoof causing uneven wear may cause foals to grow unsound limbs. Faulty limbs may be helped or even corrected by regular and persistent trimming. This practice also tends to educate the foal, making it easier to shoe at maturity. If the foal is run on pasture, you may need to trim the feet long before weaning time. Check the feet every 4 to 6 weeks. Trim a small amount each time rather than an excessive amount at longer intervals.

Before trimming the feet, inspect the foal while it is standing squarely on a hard surface. Then watch it walk and trot. Careless trimming may strain the foal's tendons.

Some common faults that may be corrected by trimming are:

Splayfoot (front toes turned out, heels turned in) can be helped or corrected by trimming the outer half of the foot.

Pigeon Toe (front toes turned in, heels turned out—opposite of splayfoot) can be helped or corrected by trimming the inner half of the foot more than the outer half.

Quarter Crack (a vertical crack on the side of the hoof) usually can be corrected if the hoof is kept moist and the toes shortened.

Cocked ankles (standing bent forward on the fetlocks—usually hind fetlocks) can be helped or corrected by lowering the heels. Cocked ankles will not occur if foals are allowed to get ample exercise and are not overfed, and the foal's heels are kept trimmed so that there is plenty of frog pressure.

Contracted heels (close at heels) can be spread apart if the heels are lowered and the frog allowed to carry more of the animal's weight.

Bedding

Select bedding material by availability and price, absorptive capacity, and potential value as a fertilizer. Bedding should not be dusty, too coarse, or too easily kicked aside.

Cereal straw or wood shavings usually make the best bedding material.

A soft, comfortable bed should insure proper rest. The animal will be much easier to groom if its bedding is kept clean.

A minimum daily allowance of clean bedding is 10 to 15 pounds per animal.

Exercise

Let your horses exercise as much as possible on pasture. They will develop strong, sound feet and legs from outdoor exercise. If no pasture is available, exercise mature animals for an hour or two a day under the saddle or in harness.

Horses with bad feet or faulty tendons may not be able to exercise on roads or under the saddle. Allow such animals to exercise in a large paddock, or on a 30- or 40-foot rope, or by leading.

5. WHAT BUILDINGS AND EQUIPMENT ARE NECESSARY?

Buildings and equipment for horses should be adequate, but need not be elaborate.

Fences

A preferred type of horse fence is constructed of poles or of 2-inch lumber. Avoid poles or lumber with projections that can cause injury.

Woven wire, or a combination of woven wire with one or more barbed wires at the top, may be used when the enclosure is not crowded. Barbed wire fence, however, is always hazardous to horses.

Stable

One or two riding horses can be stabled in a barn with other animals, or in a building used primarily for storage. Figs. 19 and 20 show one design of a building for light horses. Working drawings of this or a similar barn may be obtained from the Agricultural Engineering Dept. at the University. Table 3 gives some average dimensions of stalls, mangers, etc.

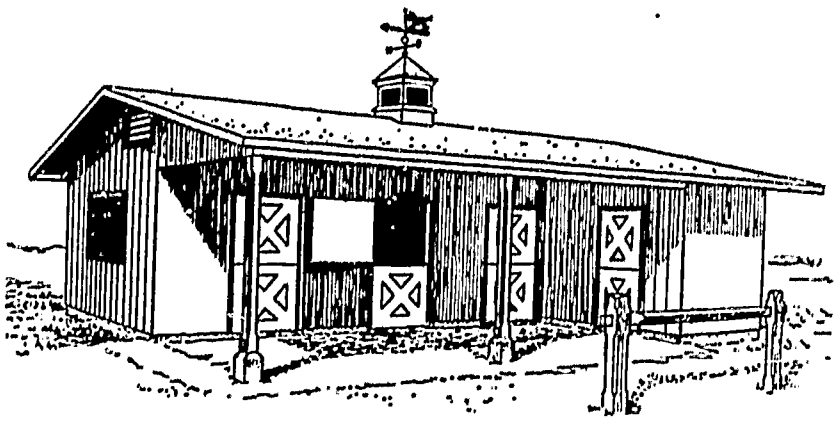

Fig. 19. One design of a light-horse barn.

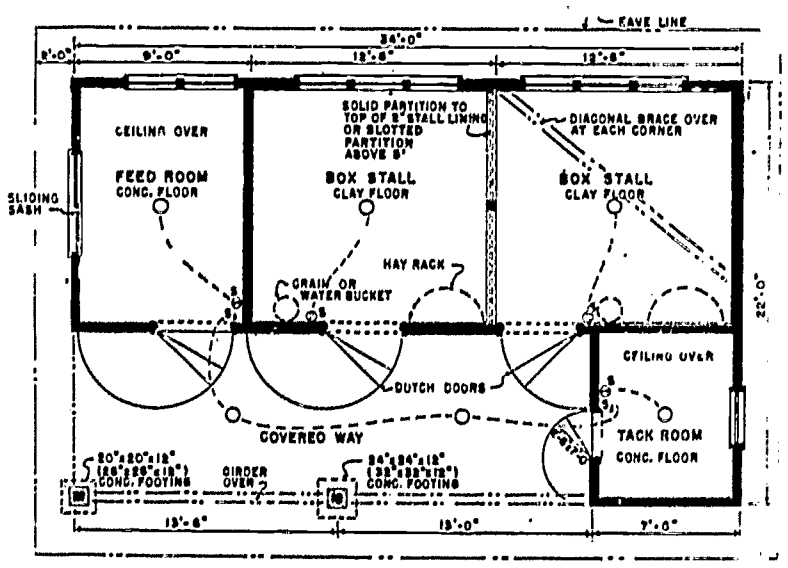

Fig. 20. Plan for barn shown in Fig. 19.

Table 3. Space Requirements of Buildings and Equipment for Horses

Type and age of animal	Stalls					Hay manger		Grain box				Water
	Dimensions tie stall, including manger	Dimensions box stall, including manger	Height of ceiling	Height of doors	Width of doors	Width	Height at throat	Width	Length	Depth of sides	Height at throat	Per head per day
Mature animals (mare or gelding).	5′ wide; 12′ to 14′ long.	10′ x 10′ to 12′ x 12′.	8′ to 12′.	8′	4′	28″	38″ to 42″.	12″ to 16″.	24″ to 30″.	8″ to 10″.	38″ to 42″.	12 gallons.
Brood mares	---do---	12′ x 12′ or larger.	---do---	---do---	---do---	---do---	---do---	---do---	---do---	---do---	---do---	Do.
Foals to 2-year-olds.	---do---	10′ x 10′	---do---	---do---	---do---	24″	32″ to 36″.	10″ to 16″.	---do---	6″ to 8″.	32″ to 36″.	6 to 8 gallons.
Stallions [1]	---do---	14′ x 14′	---do---	---do---	---do---	28″	38″ to 42″.	12″ to 16″.	---do---	8″ to 10″.	38″ to 42″.	12 gallons.

[1] Stallions either should be worked daily or provided with a 2- to 4-acre grassy paddock.

This unit was taken primarily from U. S. Dept. Agr. Farmers' Bul. 2127, "Light Horses."